

Institute of Paper Science and Technology  
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## CONTINUOUS BASELINE STUDY

Project 1108-13

Progress Report 123

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1957

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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In conjunction with the F.K.I. Continuous Baseline Study, The Institute of Paper Chemistry has been directed to identify the participating mills by means of a scrambled system of code letters. Under this system, which was initiated in Progress Report 105, each mill is identified by a code letter different from that used for the previous month.

During the month of September, eighty-six different sample lots of 42-lb. Fourdrinier kraft linerboard from sixteen different F.K.I. mills were processed at The Institute of Paper Chemistry. A tabulation of the number of samples classified according to mill may be seen in Table I.

TABLE I  
DISTRIBUTION OF 42-LB. LINERBOARD SAMPLES

Mill Code	Samples Submitted
A	3
B	2
C	3
D	5
E	7
F	0
G	8
H	4
I	10
J	4
K	6
L	7
M	4
N	4
O	2
P	8
Q	0
S	<u>9</u>
Total	86

These sample lots were tested for basis weight, caliper, bursting strength, and Elmendorf tear. The average strength results for each mill may be seen in Table II and are graphically presented in Figures 1 to 5. In addition to a comparison of the mill averages for the various tests, Table II also shows the current F.K.I. averages, the cumulative F.K.I. averages, and the F.K.I. indexes. The cumulative F.K.I. average is based on the results for the previous twelve months excluding the current period. Hence, in the case of the current report, it covers the period from September 1, 1956, to August 31, 1957. The F.K.I. indexes are obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. For example, the current F.K.I. average basis weight is 43.2 lb., and the cumulative F.K.I. average basis weight is 43.0 lb. Hence, the index for basis weight determined in per cent as indicated above is 100.5. This signifies that the current average basis weight is slightly higher than the cumulative average.

A comparison of the results in Table II and Figure 1 shows that the average basis weight results for all mills except O conform to the 42-lb. specification set forth in Rule 41. Mills L, M, and S shared the highest average basis weight, which was 44.1 lb. or approximately 5.0% higher than the 42-lb. specification. Mill O had the lowest average basis weight, of 41.7 lb., 0.7% lower than the 42-lb. specification.

The amount by which the mills vary from the 42-lb. specification is as follows:

Mill Code	Per Cent
A	+2.6
B	+2.6
C	+4.0
D	+1.4
E	+4.0
F	--
G	+3.3
H	+1.2
I	+4.0
J	+2.9
K	+1.4
L	+5.0
M	+5.0
N	+3.1
O	-0.7
P	+1.9
Q	--
S	+5.0

A comparison of the average basis weight data for the previous period with the current F.K.I. average indicated that the basis weight results have increased slightly from 42.7 lb. to 43.2 lb.

A comparison of the average caliper values for the various mills (see Figure 2) shows that the mill averages varied from a low of 12.0 points for Mills G and H to a high of 13.6 points for Mill D. The current F.K.I. average is 12.8 points, slightly higher than the cumulative F.K.I. average of 12.7 points.

The average bursting strength values obtained for each mill are graphically presented in Figure 3. It may be observed in Table II

and Figure 3 that the average bursting strength values for the various mills range from a low of 102 for Mill B to a high of 117 for Mill I. The current F.K.I. average bursting strength is 111 p.s.i. g., slightly higher than the cumulative F.K.I. average of 110 p.s.i. g. as indicated by the F.K.I. index of 100.9%.

A graphic comparison of the Elmendorf tear results for the various mills is given in Figures 4 and 5. The data of Table II show that Mill J had the highest average machine direction tear value of 376 g./sheet, whereas Mill K had the lowest value of 290 g./sheet. It may be noted also that Mill G had the highest cross-machine direction tear value of 402 g./sheet (followed closely by Mill M with 401 g./sheet) and Mill H had the lowest value of 337 g./sheet. It may be noted further that the current F.K.I. machine direction tear average is the same as the cumulative F.K.I. average and the current F.K.I. cross-machine direction tear average is very slightly higher than the cumulative average.

A comparison of the F.K.I. indexes indicates that, for the current period, the current F.K.I. averages for basis weight, caliper, bursting strength, and cross-machine direction tear are slightly higher than the corresponding cumulative F.K.I. averages, whereas the current F.K.I. average for machine direction Elmendorf tear is the same as the cumulative average.

In order to compare the variation within a given mill, the test results for each particular mill have been tabulated in Tables III to XX for Mills A and S, respectively.

The results obtained on special drum stock are presented in Table XXI.

In addition to the current and cumulative average, the mill factor and mill index are given for each mill. The cumulative mill average is the average test result obtained on the samples submitted by the particular mill for the previous twelve months excluding the current period. The mill factor and the mill index are obtained as follows:

$$\frac{\text{current mill average}}{\text{cumulative mill average}} \times 100 = \text{mill factor } (\%)$$

$$\frac{\text{current mill average}}{\text{cumulative F.K.I. average}} \times 100 = \text{mill index } (\%)$$

The mill factor and the mill index are a convenient means for comparing the current mill results either with the previous results for that particular mill or with the cumulative F.K.I. results. The reports also present a comparison of the test data obtained at the mills with test data obtained at The Institute of Paper Chemistry. These test data are presented and discussed on subsequent pages of this report.

It may be noted in Tables III through XXI that the test data include information about the sheet finish. The summarized results for the mills which submitted sample lots during the current period are as follows:

Mill Code	No. of Sample Lots		
	W.F.	D.F.	Misc.
A	3 <sup>a</sup>		
B	2		
C	3 <sup>a</sup>		
D	5 <sup>a</sup>		
E	6, 1 <sup>a</sup>		

(Continued on next page.)

Mill Code	No. of Sample Lots		
	W.F.	D.F.	Misc.
F	No samples submitted.		
G	8		
H	4		
I	10		
J	4		
K	4, 2 <sup>b</sup>		
L	7		
M	4		
N	4 <sup>a</sup>		
O	2 <sup>a</sup>		
P	8		
Q	No samples submitted.		
S	9		
R <sup>c</sup>	No samples submitted.		

<sup>a</sup> One side only.

<sup>b</sup> Unidentified as to finish.

<sup>c</sup> Drum linerboard.

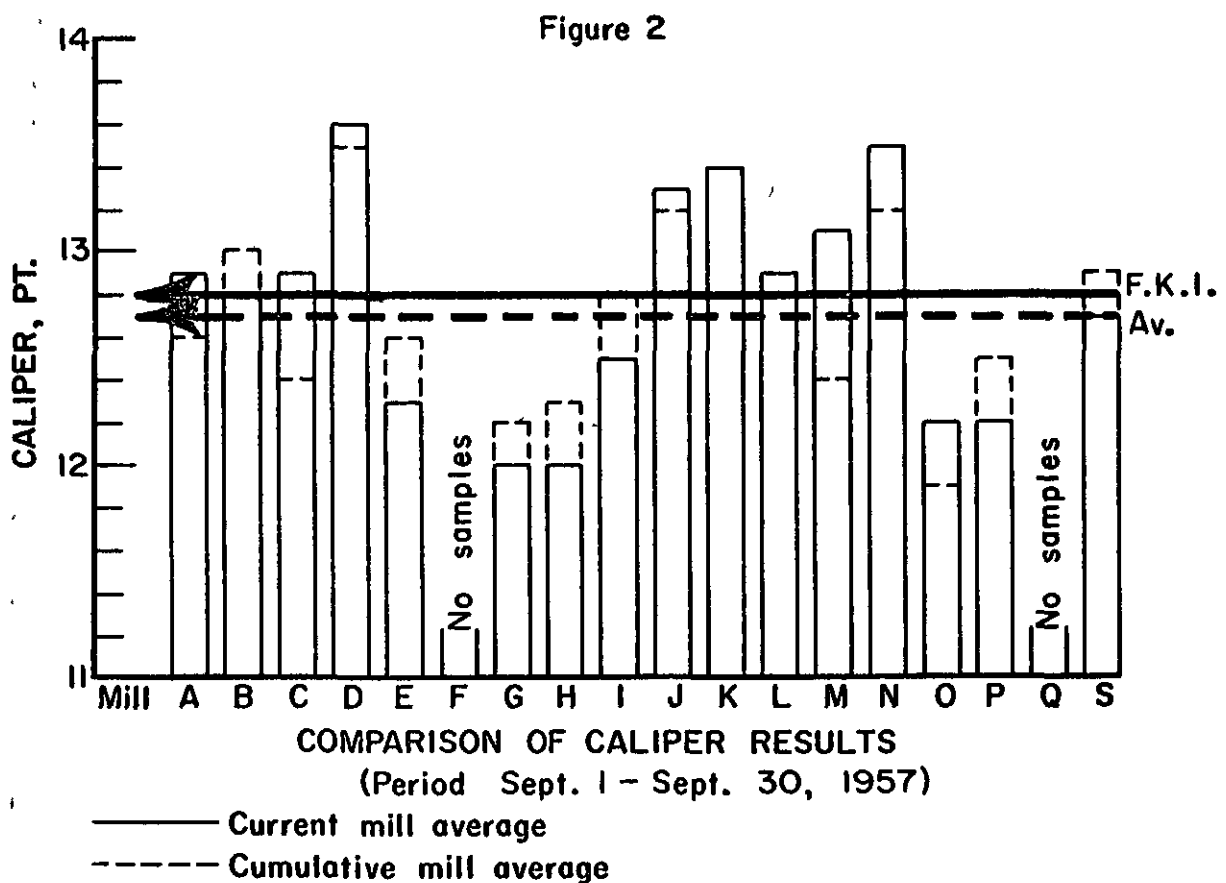
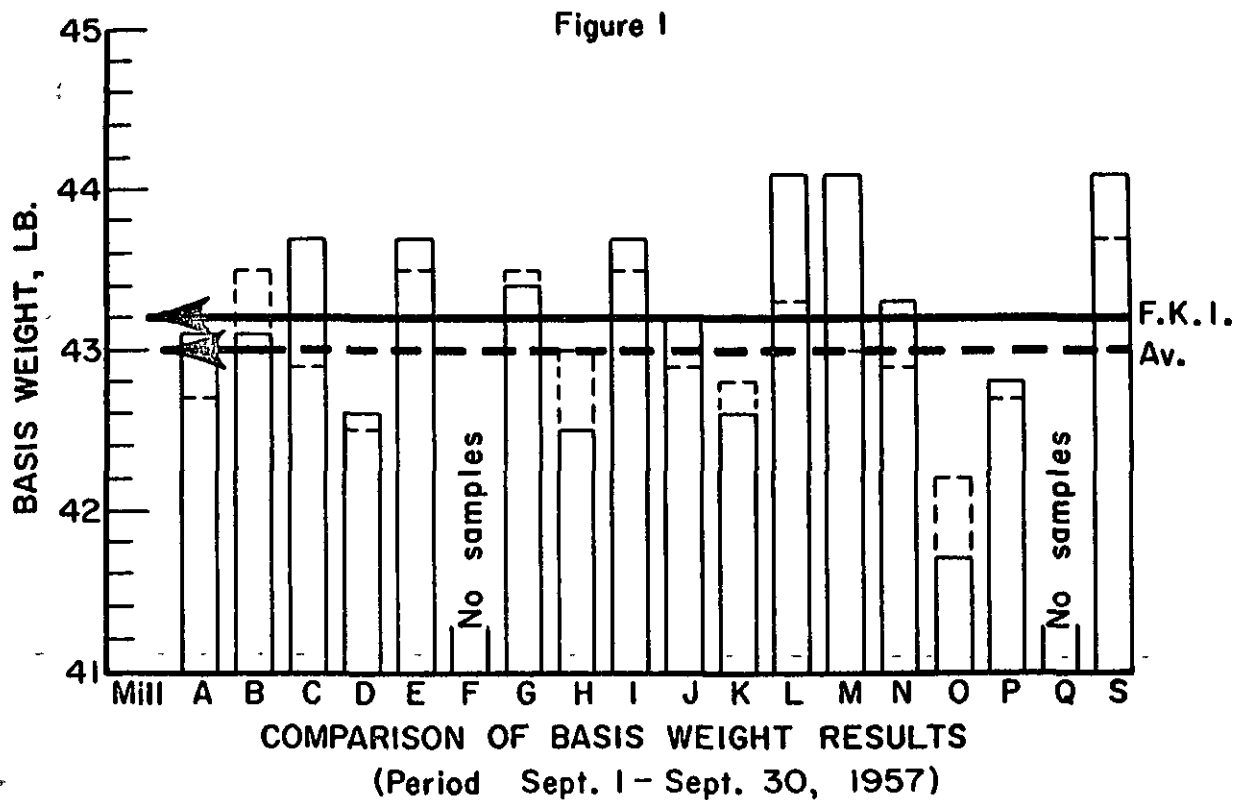
The results indicate that all participating mills are using a water finish on their 42-lb. linerboard.

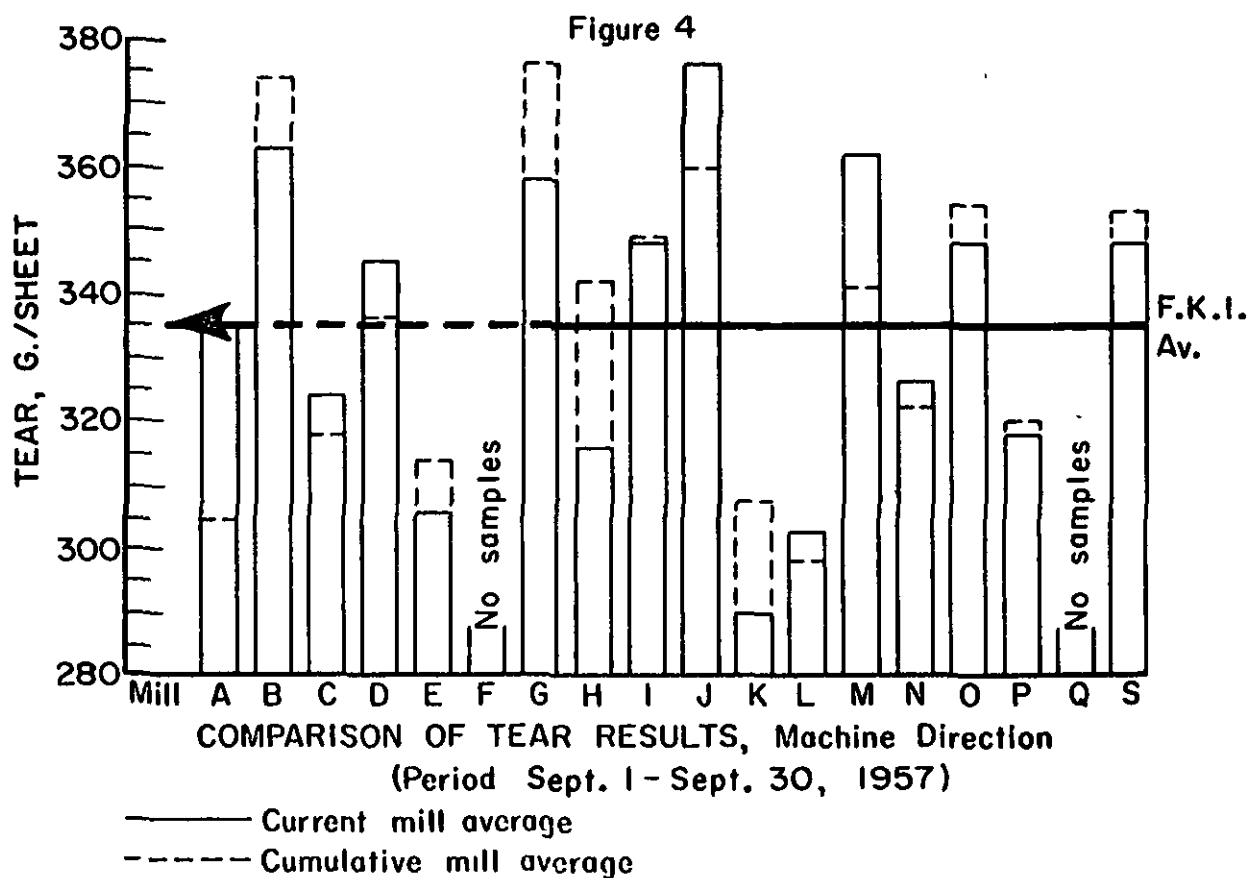
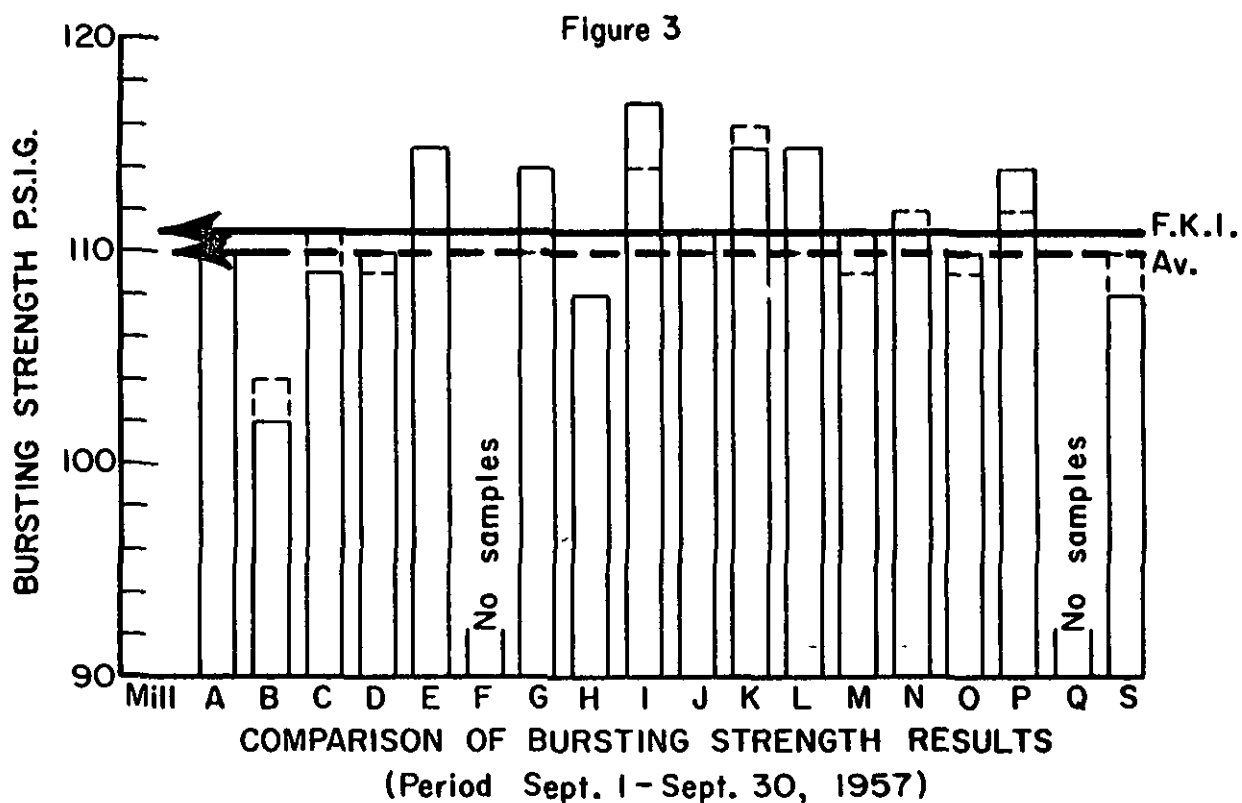


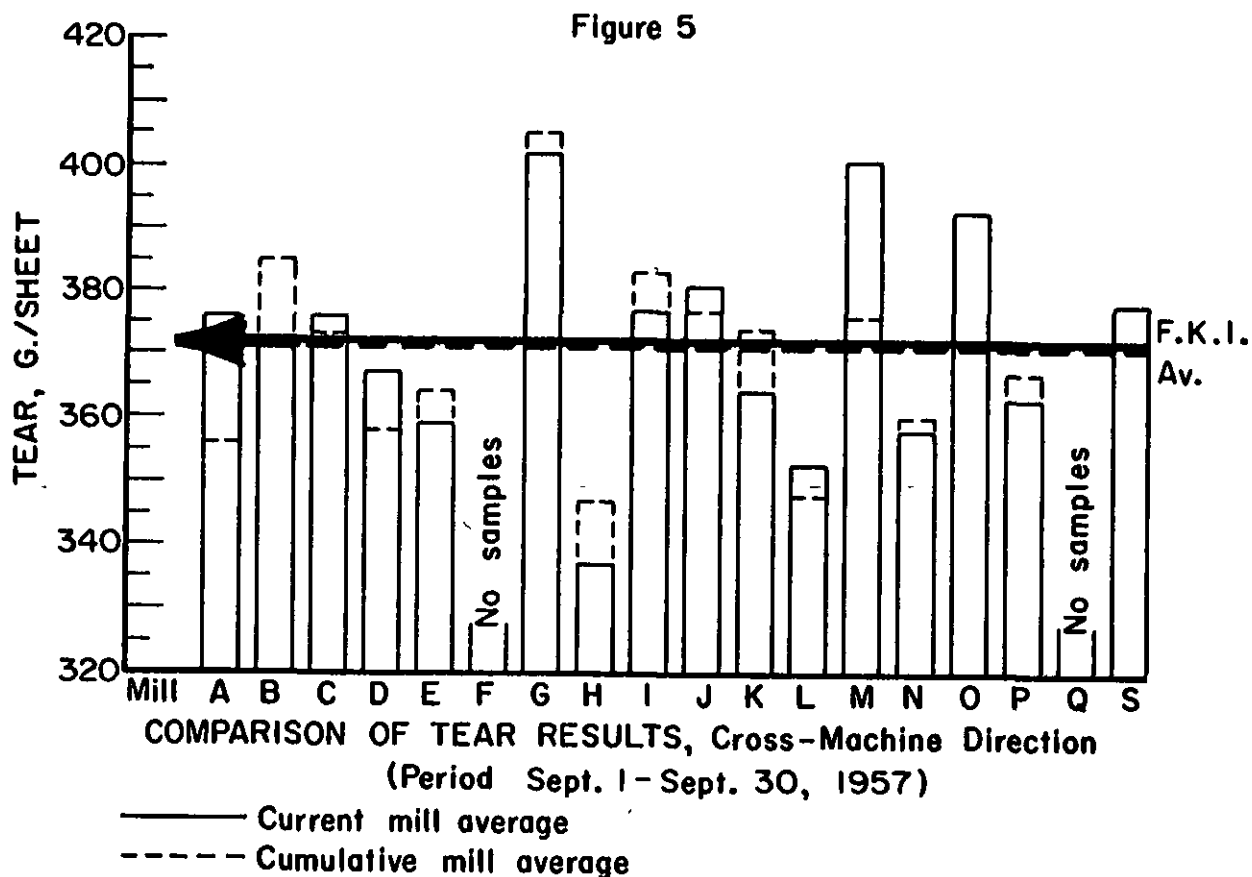
TABLE II

SUMMARY OF COMPOSITE MILL AVERAGES--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	Elmendorf Tear, g./sheet	
				In Machine	Cross Machine
A	43.1	12.9	110	335	376
B	43.1	12.8	102	363	372
C	43.7	12.9	109	324	376
D	42.6	13.6	110	345	367
E	43.7	12.3	115	306	359
F	No samples submitted.				
G	43.4	12.0	114	358	402
H	42.5	12.0	108	316	337
I	43.7	12.5	117	348	377
J	43.2	13.3	111	376	381
K	42.6	13.4	115	290	364
L	44.1	12.9	115	303	353
M	44.1	13.1	111	362	401
N	43.3	13.5	111	326	358
O	41.7	12.2	110	348	393
P	42.8	12.2	114	318	363
Q	No samples submitted.				
S	44.1	12.7	108	348	378
Current FKI Average.	43.2	12.8	111	335	372
Cumulative FKI Average:	43.0	12.7	110	335	371
FKI Index, %	100.5	100.8	100.9	100.0	100.3







SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957

TABLE III  
MILL A -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Sch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., edge		Elmendorf Tear, g./sheet								
					max.	min.	av.	max.	min.	av.	max.	min.	av.	max.	min.	av.			
175545	WFLS	9/ 9/57	8/29/57	1	46.0	43.8	44.2	13.7	13.0	13.2	145	97	115	392	230	339	432	352	334 <sup>a</sup>
175546	WFLS	9/ 9/57	8/30/57	1	44.0	41.8	42.7	13.5	12.7	13.1	124	85	106	384	272	322	432	320	359 <sup>a</sup>
175579	WFLS	9/12/57	9/ 5/57	1	43.8	41.0	42.5	13.2	11.8	12.5	130	90	108	376	312	344	416	332	385 <sup>a</sup>
Current Mill Average.					43.1			12.9			110			335			376		
Cumulative Mill Average					42.7			12.6			110			305			356		
Mill Factor, %					100.9			102.4			100.0			109.8			105.6		
Mill Index, %					100.2			101.6			100.0			100.0			101.3		

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE IV  
MILL B -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.						
175532	S.F.	9/ 5/57	8/26/57	7	44.0	39.6	41.8	13.0	11.7	12.2	113	79	93	384	288	328 <sup>a</sup>	384	336	357 <sup>a</sup>
175609	S.F.	9/18/57	9/12/57	7	45.0	43.8	44.4	14.0	12.9	13.5	139	88	106	456	304	399 <sup>a</sup>	456	328	387 <sup>a</sup>
Current Mill Average							43.1			12.8			102			363			372
Cumulative Mill Average							43.5			13.0			104			374			385
Mill Factor, %							99.1			98.5			98.1			97.1			96.6
Mill Index, %							100.2			100.8			92.7			108.4			100.3

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE V

MILL C -- 42-LB. LINERBOARD

File No	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
175531	WFLS	9/ 4/57	8/23/57	1	43.6	42.4	43.1	13.8	12.2	12.9	131	84	105	416	264	321 <sup>a</sup>
175645	WFLS	9/24/57	9/14/57	1	44.2	43.0	43.7	13.2	12.1	12.6	130	92	107	392	304	338 <sup>a</sup>
175646	WFLS	9/24/57	9/15/57	1	45.0	43.6	44.2	13.8	12.8	13.1	137	99	115	352	283	313 <sup>a</sup>
Current Mill Average					43.7			12.9			109			324		
Cumulative Mill Average					42.9			12.4			111			318		
Mill Factor, %					101.9			104.0			98.2			101.9		
Mill Index, %					101.6			101.6			99.1			96.7		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE VI  
MILL D -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I. Gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
175574	WFLS	9/11/57	8/22/57	2	44.2	42.0	43.1	14.3	13.0	13.7	124	77	104	408	336	373 <sup>a</sup>
175575	WFLS	9/11/57	8/28/57	2	43.6	41.6	42.4	14.2	13.0	13.7	130	90	111	416	296	343 <sup>a</sup>
175578	WFLS	9/12/57	9/ 6/57	2	43.0	41.8	42.3	14.3	13.1	13.7	124	84	107	384	304	335
175601	WFLS	9/16/57	9/ 9/57	2	45.8	41.8	43.3	14.3	13.3	13.9	125	93	112	400	320	352 <sup>a</sup>
175610	WFLS	9/19/57	9/13/57	2	42.6	41.4	42.0	13.9	12.3	13.1	135	104	119	384	248	325 <sup>a</sup>
Current Mill Average.					42.6			13.6			110			345		
Cumulative Mill Average					42.5			13.5			109			336		
Mill Factor, %					100.2			100.7			100.9			102.7		
Mill Index, %					99.1			107.1			100.0			103.0		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.



SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE VII  
MILL E -- 42-LB. LINERBOARD

File No	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
175499	W F.	9/3/57	8/19/57	2	44.0	42.8	12.3	12.0	137	98	320	256
175500	W F.	9/3/57	8/19/57	2	44.2	43.8	12.3	12.0	129	100	352	277
175547	W F.	9/9/57	8/25/57	1	44.0	42.6	13.2	12.2	133	105	336	256
175643	W F.	9/24/57	9/7/57	2	44.2	42.8	12.6	12.1	129	97	400	272
175650	W F.	9/25/57	9/7/57	2	44.2	43.6	12.7	11.9	141	98	344	272
175644	W F.	9/24/57	9/8/57	2	43.8	42.4	12.5	12.0	130	101	352	272
175651	W F.	9/25/57	9/11/57	2	44.0	43.8	12.8	12.1	130	103	360	272
Current Mill Average.					43.7		12.3		115		306	
Cumulative Mill Average					43.5		12.6		111		314	
Mill Factor, %					100.5		97.6		103.6		97.5	
Mill Index, %					101.6		96.9		104.5		91.3	

TABLE VIII

MILL F -- 42-LB. LINERBOARD

No samples submitted.

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTED DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE IX

MILL G -- 42-I.B. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i.			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
175511	N.B.	9/ 3/57	8/ 8/57	-	44.2	43.4	43.9	12.1	11.6	12.0	137	98	117	384	336	358
175512	N.B.	9/ 3/57	8/ 8/57	-	45.0	42.2	43.1	12.7	11.7	12.0	138	96	117	432	320	380
175513	N.B.	9/ 3/57	8/14/57	-	44.6	42.0	42.5	12.1	11.1	11.7	120	90	109	432	336	377 <sup>a</sup>
175518	N.B.	9/20/57	8/23/57	-	43.8	41.2	42.5	12.3	11.2	12.0	132	97	115	400	320	359 <sup>a</sup>
175519	N.B.	9/20/57	8/27/57	-	44.2	42.2	43.2	12.5	11.5	12.1	127	96	114	384	304	341 <sup>a</sup>
175520	N.B.	9/20/57	8/29/57	-	45.0	43.6	44.1	12.4	11.6	12.0	131	88	108	400	312	353 <sup>a</sup>
175521	N.B.	9/20/57	9/10/57	-	45.4	41.2	43.6	12.3	11.1	11.9	141	105	119	384	320	343
175522	N.B.	9/20/57	9/10/57	-	46.0	43.4	44.1	12.4	11.9	12.1	141	99	115	384	320	356 <sup>a</sup>
Current Mill Average					43.4			12.0			114			358		402
Cumulative Mill Average					43.5			12.2			110			376		405
Mill Factor, %					99.8			98.4			103.6			95.2		99.3
Mill Index %					100.9			94.5			103.6			106.9		103.4

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE X  
MILL H -- 42-LB. LINERBOARD

File No	Finish	Date Recd	Date Made	Mch. No	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
175501	I.F.	9/3/57	8/9/57	-	42.8	40.0	12.3	11.4	136	81	360	324 <sup>a</sup>
175502	I.F.	9/3/57	8/9/57	-	42.8	40.8	12.3	11.2	128	98	360	319 <sup>a</sup>
175537	M.F.	9/23/57	8/27/57	-	43.8	42.2	12.8	11.9	115	90	352	308 <sup>a</sup>
175538	M.F.	9/23/57	8/27/57	-	44.0	42.4	12.5	11.8	118	95	336	312
Current Mill Average					42.5		12.0		108		316	
Cumulative Mill Average					43.0		12.3		108		342	
Mill Factor, %					98.8		97.6		100.0		92.4	
Mill Index, %					98.8		94.5		98.2		94.3	
											337	
											347	
											335 <sup>a</sup>	
											384	
											312	
											360	
											304	
											368	
											304	
											338 <sup>a</sup>	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XI  
MILL I -- 42-LB. LINERBOARD

File No.	Finnson	Date Recd.	Date Made	Mch No	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
175541	W.F.	9/9/57	9/28/57	-	45.2	43.6	13.3	12.0	127	98	403	296
175542	W.F.	9/9/57	8/29/57	-	46.6	45.0	14.2	13.0	133	103	448	336
175543	W.F.	9/9/57	9/4/57	-	44.4	42.2	12.3	11.3	137	87	376	336
175624	W.F.	9/20/57	9/6/57	-	44.2	43.2	13.0	12.1	136	96	368	272
175625	W.F.	9/20/57	9/16/57	-	44.4	42.4	13.8	12.5	142	105	392	296
175626	W.F.	9/20/57	9/16/57	-	43.0	41.4	13.2	12.0	135	100	400	296
175627	W.F.	9/20/57	9/16/57	-	43.0	41.4	13.1	12.0	134	94	352	296
175647	W.F.	9/25/57	9/18/57	-	45.4	44.0	12.9	12.0	141	102	368	296
175648	W.F.	9/25/57	9/19/57	-	44.4	42.2	12.8	11.7	133	100	352	304
175649	W.F.	9/25/57	9/23/57	-	44.6	42.8	12.3	11.7	135	93	384	320
Current Mill Average					43.7		12.5		117		348	
Cumulative Mill Average.					43.5		12.8		114		349	
Mill Factor, %					100.5		97.7		102.6		99.7	
Mill Index, %					101.6		98.4		106.4		103.9	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XII

MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. edge		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.						
														Max.	Min.	Av.	Max.	Min.	Av.
175504	✓	9/ 3/57	8/ 7/57	4	44.8	42.2	43.4	14.0	13.0	13.6	129	89	116	432	368	397 <sup>a</sup>	44.8	360	395 <sup>a</sup>
175505	✓	9/ 3/57	8/14/57	4	42.6	40.6	41.8	13.8	12.5	13.0	122	65	106	416	352	375 <sup>a</sup>	416	328	363 <sup>a</sup>
175606	✓	9/17/57	9/ 5/57	4	44.4	42.8	43.9	14.0	13.1	13.6	124	91	110	384	344	367	408	336	375 <sup>a</sup>
175607	✓	9/17/57	9/ 7/57	4	44.0	42.0	43.6	13.2	12.2	13.0	129	93	114	392	344	364	416	352	392 <sup>a</sup>
Current Mill Average							43.2			13.3			111			376			381
Cumulative Mill Average.							42.9			13.2			110			360			377
all Factor, %							100.7			100.8			100.9			104.4			101.1
all Index, %							100.5			104.7			100.9			112.2			102.7

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XIII

MILL K -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
175497	---	9/ 3/57	8/12/57	-	43.2	42.0	14.9	13.6	133	80	113	352
175498	---	9/ 3/57	8/16/57	-	44.0	43.0	14.0	13.0	145	100	121	352
175639	W.F.	9/23/57	8/20/57	1	42.4	41.8	13.2	12.7	137	95	114	328
175640	W.F.	9/23/57	8/23/57	1	42.2	41.4	13.5	12.6	135	102	118	312
175641	W.F.	9/23/57	8/28/57	1	42.2	41.8	13.7	12.0	147	77	114	328
175642	W.F.	9/23/57	9/ 4/57	1	44.6	43.0	14.8	13.3	136	88	114	336
Current Mill Average:					42.6		13.4		115		290	
Cumulative Mill Average:					42.8		13.4		116		308	
Mill Factor, %					99.5		100.0		99.1		94.2	
Mill Index, %					99.1		105.5		104.5		86.6	
											97.3	
											98.1	

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XIV  
MILL L -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Ach. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
175495	N.F.	9/3/57	8/15/57	1	44.8	43.0	13.2	12.3	130	92	113	368
175496	N.F.	9/3/57	8/20/57	1	44.4	43.0	13.3	12.4	138	97	116	344
175623	N.F.	9/20/57	8/27/57	1	44.8	43.6	13.1	12.2	131	81	114	368
175633	N.F.	9/23/57	9/5/57	1	44.8	44.2	13.2	12.3	134	97	116	352
175634	N.F.	9/23/57	9/9/57	1	44.8	44.1	13.6	12.3	135	100	115	368
175635	N.F.	9/23/57	9/11/57	1	44.8	42.4	13.4	12.6	133	96	115	320
175636	N.F.	9/23/57	9/16/57	1	44.4	43.6	13.8	12.2	132	96	116	352
Current Mill Average					44.1		12.9		115		303	
Cumulative Mill Average.					43.3		12.8		110		298	
Mill Factor, %					101.8		100.8		104.5		101.7	
Mill Index, %					102.6		101.6		104.5		90.4	
											95.1	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XV  
MILL M -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.			
175509	W.F.	9/ 3/57	8/19/57	2	44.4	44.0	44.1	13.1	12.2	12.8	147	80	114	392	336	371	448	384	417 <sup>a</sup>
175510	W.F.	9/ 3/57	8/20/57	2	44.4	44.0	44.1	13.1	12.5	12.9	132	87	110	400	336	375	424	376	405 <sup>a</sup>
175604	W.F.	9/17/57	9/ 3/57	2	44.2	43.8	44.0	13.6	13.1	13.3	132	85	109	400	320	359 <sup>a</sup>	432	352	385 <sup>a</sup>
175605	W.F.	9/17/57	9/ 4/57	2	44.8	43.8	44.1	13.7	13.1	13.3	135	82	111	384	288	345	464	352	398 <sup>a</sup>
Current Mill Average							44.1			13.1			111			362			401
Cumulative Mill Average							43.0			12.4			109			341			376
Mill Factor, %							102.6			105.6			101.8			106.2			106.6
Mill Index, %							102.6			103.1			100.9			108.1			108.1



SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XVI  
MILL N -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Across					
															Max.	Min.	Av.	Max.	Min.
175544	WFLS	9/9/57	9/1/57	1	44.0	42.4	43.6	14.1	13.0	13.6	128	90	109	368	272	311 <sup>a</sup>	384	320	357 <sup>a</sup>
175581	WFLS	9/13/57	9/1/57	1	43.8	42.2	43.4	14.4	13.3	13.8	141	92	117	384	304	363	400	328	374 <sup>a</sup>
175631	WFLS	9/23/57	9/10/57	1	44.0	42.6	43.5	13.4	12.8	13.0	136	94	110	352	272	304	368	320	352 <sup>a</sup>
175632	WFLS	9/23/57	9/10/57	1	43.2	42.4	42.8	14.1	13.0	13.6	125	86	109	376	280	325 <sup>a</sup>	368	320	347 <sup>a</sup>
Current Mill Average:							43.3			13.5		111		326				358	
Cumulative Mill Average							42.9			13.2		112		322				360	
Mill Factor, %							100.9			102.3		99.1		101.2				99.4	
Mill Index, %							100.7			106.3		100.9		97.3				96.5	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XVII

MILL O -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I., Edge		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.			
175508	WFLS	9/ 3/57	8/24/57	1	43.0	41.8	42.3	13.1	11.9	12.3	135	103	117	384	328	355	432	392	408 <sup>a</sup>
175503	WFLS	9/ 3/57	8/26/57	1	42.0	40.4	41.2	12.9	11.5	12.1	115	90	103	384	272	341	416	352	377 <sup>a</sup>
Current Mill Average							41.7			12.2			110			348			393
Cumulative Mill Average							42.2			11.9			109			354			393
Mill Factor, %							98.8			102.5			100.9			98.3			100.0
Mill Index, %							97.0			96.1			100.0			103.9			105.9

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XVIII

MILL P -- 42-LB. LINERBOARD

File No.	Flurish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. Range		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.						
175506	N.F.	9/ 3/57	8/21/57	2	42.4	40.8	41.9	12.4	11.3	12.0	134	98	111	336	272	312	400	304	368 <sup>a</sup>
175507	W.F.	9/ 3/57	8/21/57	2	42.4	41.2	41.9	12.7	11.7	12.1	140	96	115	352	272	309	384	320	357 <sup>a</sup>
175548	W.F.	9/ 9/57	8/27/57	1	45.4	44.0	44.3	13.2	12.1	12.8	139	90	116	384	304	333	432	352	386 <sup>a</sup>
175549	W.F.	9/ 9/57	8/27/57	1	46.0	42.4	44.1	13.1	12.0	12.6	142	83	115	400	280	335	416	320	369 <sup>a</sup>
175576	W.F.	9/11/57	8/30/57	2	44.0	42.0	43.1	13.1	11.9	12.4	139	92	114	352	280	321	384	320	359 <sup>a</sup>
175577	W.F.	9/11/57	8/30/57	2	44.0	41.8	43.1	13.0	10.9	12.1	140	92	113	336	280	314	384	336	361 <sup>a</sup>
175582	W.F.	9/13/57	8/31/57	1	43.4	41.6	42.2	12.7	11.0	12.0	130	86	115	368	272	303	400	320	361 <sup>a</sup>
175583	W.F.	9/13/57	8/31/57	1	43.2	41.6	42.2	12.2	11.8	12.0	135	90	115	368	288	316	368	304	344
Current Mill Average:							42.8			12.2			114			318			363
Cumulative Mill Average:							42.7			12.5			112			320			367
Mill Factor, %							100.2			97.6			101.8			99.4			98.9
Mill Index, %							99.5			96.1			103.6			94.9			97.8

TABLE XIX

MILL Q -- 42-LB. LINERBOARD

No samples submitted.

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XX

MILL S -- 42-LB. LINERBOARD

File No	Furn	Date Recd	Date Made	Mch No.	Basis Weight, lb.			Caliper Points			Bursting Strength, P.S.I. gage			Elmerdorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
175611	N.F.	9/19/57	8/28/57	-	45.6	43.8	44.3	13.8	12.9	13.2	122	87	108	416	328	359 <sup>a</sup>
175612	N.F.	9/19/57	8/29/57	-	44.0	43.0	43.7	13.2	12.3	12.8	117	90	104	432	258	355 <sup>a</sup>
175613	N.F.	9/19/57	8/30/57	-	46.0	44.0	45.2	13.2	12.2	12.8	136	94	109	400	336	373 <sup>a</sup>
175615	N.F.	9/20/57	9/11/57	-	44.0	43.4	43.8	13.1	12.6	12.9	127	90	110	384	304	346 <sup>a</sup>
175616	N.F.	9/20/57	9/12/57	-	44.0	43.4	43.7	12.8	12.2	12.5	124	90	107	360	296	330 <sup>a</sup>
175617	N.F.	9/20/57	9/13/57	-	44.2	43.8	44.0	12.7	12.2	12.4	126	91	108	384	304	333 <sup>a</sup>
175623	N.F.	9/23/57	9/18/57	-	44.4	43.8	44.0	12.2	11.9	12.0	118	93	106	360	304	337 <sup>a</sup>
175629	N.F.	9/23/57	9/19/57	-	45.6	43.8	44.2	12.9	12.1	12.4	131	101	112	392	272	334 <sup>a</sup>
175630	N.F.	9/23/57	9/20/57	-	45.0	43.6	44.0	14.0	13.0	13.5	131	93	112	416	320	364 <sup>a</sup>
Current mill average.					44.1			12.7			108			348		
Cumulative mill average					43.7			12.9			110			353		
Mill Factor, %					100.9			98.4			98.2			98.6		
Mill Index, %					102.6			100.0			98.2			103.9		

TABLE XXI

MILL R -- 47-LB. DRUM LINERBOARD

No samples submitted.

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

As a supplementary part of the Continuous Baseline Study, comparisons of the mill test results with those obtained at The Institute of Paper Chemistry on corresponding samples have been included in this report. As may be noted in Table XXII, the atmospheric conditions used prior to and during the testing period were relatively uniform for the mills which reported this information. However, the conditioning periods varied considerably.

TABLE XXII

Mill Code	Preconditioning			Conditioning		
	R.H., %	Temp., °F.	Time, hr.	R.H., %	Temp., °F.	Time, hr.
A	65-79	74-80	24-84	74-83	75-83	2
B	50	73	24	50	73	--
C		None		51-58	61-70	--
D	50	70-73	24		None	
E		None		50	73	24
F			No samples submitted.			
G		None		40-50	72-73	48
H		None		50	73	0.5
I		None		50	73	24-168
J		None		52	72	--
K		None		70-89	82-96	--
L	44-48	75-86	0.5	50	70-73	24-48
M		None		50	73	24
N		None		41-70	84-94	--
O	50	73	24		None	
P	50	73	24	50	73	24
Q			No samples submitted.			
S	33-36	78	8	51-52	73-74	16

A summary of the Institute and mill test results for the current period is shown in Table XXIII, and a comparison of differences between Institute and mill test results is given in Table XXIV for the

current period and the two previous periods. The comparisons are given in Tables XXV to XLII, for the 42-lb. liner samples. A comparison of the special drum stock is given in Table XLIII. In all the comparisons given in Tables XXV to XLIII, the Institute's test values have been used as the reference line.

A comparison of the test data in Tables XXIII and XXIV reveals the level of agreement between mill and Institute data for basis weight, caliper, bursting strength, and Elmendorf tear. Table XXIII shows the average difference between Institute and mill test results for all sample lots submitted by each mill for the current period. In addition, the maximum difference encountered in comparing the Institute and mill test results for a given sample lot is shown. In Table XXIV, the average differences shown for each test in Table XXIII have been calculated on a percentage basis for each mill. In addition, for purposes of comparison, the average percentage differences for the preceding two periods are shown.

It may be noted in Table XXIV that the maximum variation between the average basis weight results of the Institute and those of a given mill on corresponding samples is three per cent for the current period. By comparison, the maximum percentage variation noted for the previous two periods was four per cent. Further, it may be noted that the average basis weight results for Mills B, D, O, and P are higher than those for the Institute, the average results for Mills A and M are the same and the average results for the other mills are lower. None of the variations for the current period appear to be excessive.

The maximum variation in caliper for the current period is six per cent. This variation is the same as the maximum variation for the previous two periods. Compared with the Institute's test results, the test results for all mills are lower with the exception of the result for Mill E which is the same and that for Mill L which is slightly higher. The variations for Mills D and S appear to be excessive.

It may be noted in Table XXIV that the bursting strength results exhibited a maximum variation of nine per cent for the current period. The average results for Mills B and M are higher than those for the Institute, the average result for Mill G is the same, and the results for the other mills are lower. Only the variation associated with the result for Mill A appears to be excessive.

It may be seen in Tables XXIII and XXIV that the average machine direction tear results for Mills C, D, E, H, J, L, M, N, O, and P are higher than those for the Institute, and the results for the other mills are lower. The maximum variation for the current period is thirteen per cent. The variations which exceed a magnitude of ten per cent may be excessive. Mills in this category include I and N.

With regard to the cross-machine direction tear results, it may be noted that the average results for Mills A, B, C, D, E, G, H, L, M, N, and O are higher than those for the Institute, and the average results for the other mills are lower. The maximum variation for the current period is eighteen per cent. The variations noted for Mills M, N, and O exceed ten per cent and appear to be excessive.

TABLE XXIII  
SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS)

Mills*	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S
No. Samples Compared	3	2	3	5	7	0	3	4	10	4	6	7	4	4	2	8	0	9
	<u>Basis Weight</u>																	
Institute	43.1	43.1	43.7	42.6	43.7	43.4	42.5	42.5	43.7	43.2	42.6	44.1	44.1	43.3	41.7	42.3	44.1	44.1
Mill	43.1	43.4	42.7	43.7	42.8	43.2	42.3	42.3	43.5	42.5	42.1	43.9	44.1	42.4	41.9	43.1	43.1	43.8
Av. Diff.**	0.0	+0.3	-1.0	+1.1	-0.9	-0.2	-0.2	-0.2	-0.2	-0.7	-0.5	-0.2	0.0	-0.9	+0.2	+0.3	+0.3	-0.3
Max. Diff.***	-0.5	+0.4	-1.5	+1.7	-1.0	-1.1	-1.1	-1.1	-0.6	-0.9	-1.6	+0.8	-0.7	-1.5	+0.7	+0.6	+0.6	-0.8
	<u>Caliper</u>																	
Institute	12.9	12.8	12.9	13.6	12.3	12.0	12.0	12.0	12.5	13.3	13.4	12.9	13.1	13.5	12.2	12.2	12.2	12.7
Mill	12.5	12.6	12.8	12.8	12.3	11.4	11.9	11.9	12.3	12.5	13.0	13.0	12.8	13.1	11.7	11.9	11.9	12.6
Av. Diff.**	-0.4	-0.2	-0.1	-0.8	0.0	-0.6	-0.1	-0.2	-0.2	-0.8	-0.4	+0.1	-0.3	-0.4	-0.5	-0.3	-0.3	-0.1
Max. Diff.***	-0.6	-0.4	-0.2	-1.4	+0.4	-0.7	-0.3	-0.3	-0.5	-0.9	-0.6	+0.4	-0.5	-0.9	-0.6	-0.5	-0.5	-0.5
	<u>Bursting Strength</u>																	
Institute	110	102	109	110	115	114	108	117	111	111	115	115	111	111	110	114	114	108
Mill	100	103	108	105	112	114	107	112	108	108	110	113	112	106	104	111	111	105
Av. Diff.**	-10	+1	-1	-5	-3	0	-1	-5	-3	-3	-5	-2	+1	-5	-6	-3	-3	-3
Max. Diff.***	-13	+2	-5	-8	-6	+5	-4	-9	-7	-7	-10	-4	+4	-8	-9	-6	-6	-9
	<u>Tearing Strength, in</u>																	
Institute	335	363	324	345	306	358	316	348	376	376	290	303	362	326	348	318	348	348
Mill	324	356	349	358	315	349	328	311	377	377	275	314	393	370	355	322	339	339
Av. Diff.**	-11	-7	+25	+13	+9	-9	+12	-37	+1	+1	-15	+11	+31	+44	+7	+4	-5	-5
Max. Diff.***	-18	-26	+48	+31	+42	-44	+18	-65	+19	+19	-30	+32	+51	+113	+14	+14	-21	-21
	<u>Tearing Strength, across</u>																	
Institute	376	372	376	367	359	402	337	377	381	381	364	353	401	358	393	363	378	378
Mill	390	400	407	402	379	406	364	362	379	379	354	368	469	422	445	359	376	376
Av. Diff.**	+14	+28	+31	+35	+20	+4	+27	-15	-2	-2	-10	+15	+68	+64	+52	-4	-2	-2
Max. Diff.***	+19	+28	+38	+73	+30	+24	+39	-46	+21	+21	-51	+39	+82	+93	+58	-20	-20	-20

\* Comparison based on averages involved only those samples on which mill test data were submitted.

\*\* Average difference is the difference between the Institute mill average and the mill average based on mill test data.

\*\*\* Maximum difference encountered in comparing the Institute average and the mill average for any sample submitted by that particular mill.



TABLE XXIV  
COMPARISON OF INSTITUTE-MILL DIFFERENCES BY PERIODS  
Average Differences, per cent

Mill	Period	Basis Weight	Caliper	Burst	Tear, in	Tear, across	Mill	Period	Basis Weight	Caliper	Burst	Tear, in	Tear, across
A	Current	0	-3	-9	-3	+4	J	Current	-2	-6	-3	+0.3	-0.5
	122nd	-0.5	-4	-4	+4	+6		122nd	-0.5	-6	-4	-2	+0.3
	121st	+3	-4	-2	+3	+2		121st	-0.9	-5	-0.9	-2	-3
B	Current	+0.7	-2	+1	-2	+8	K	Current	-1	-3	-4	-5	-3
	122nd	+0.2	-3	+4	-6	+1		122nd	-1	-2	-8	-10	-5
	121st	+0.2	-4	+2	-6	-1		121st	-0.5	-3	-3	-9	-2
C	Current	-2	-0.8	-0.9	+6	+6	L	Current	-0.5	+0.8	-2	+4	+4
	122nd	-0.5	-2	0	+6	+10		122nd	-0.9	0	-0.9	+5	+8
	121st	+0.5	-0.8	+0.9	+10	+11		121st	-0.2	+0.8	-0.9	+8	+6
D	Current	+3	-6	-5	+4	+10	M	Current	0	-2	+0.9	+9	+17
	122nd	+3	-6	-6	+2	+14		122nd	+0.7	-3	+3	+4	+12
	121st	+3	--	-2	+5	+13		121st	+4	0	+5	+6	+6
E	Current	-2	0	-3	+3	+6	N	Current	-2	-3	-5	+13	+18
	122nd	0	-3	+0.9	+4	+1		122nd	-0.7	-5	+0.9	+11	+15
	121st	-1	-2	0	+4	+5		121st	-2	-3	-4	+3	+7
F	Current	--	--	--	--	--	O	Current	+0.5	-4	-5	+2	+13
	122nd	--	--	--	--	--		122nd	--	--	--	--	--
	121st	--	--	--	--	--		121st	+0.7	-3	-4	+8	+9
G	Current	-0.5	-5	0	-3	+1	P	Current	+0.7	-2	-3	+1	-1
	122nd	-0.5	-4	-4	-10	-2		122nd	+1	-2	+4	+4	+3
	121st	--	--	--	--	--		121st	+1	-2	0	+1	-2
H	Current	-0.5	-0.8	-0.9	+4	+8	Q	Current	--	--	--	--	--
	122nd	+0.2	-3	-2	+12	+14		122nd	--	--	--	--	--
	121st	-2	-2	-0.9	+10	+12		121st	-0.2	+0.9	-3	-12	-3
I	Current	-0.5	-2	-4	-11	-4	S	Current	-0.7	-0.8	-3	-3	-0.5
	122nd	+0.2	-2	-6	-5	+0.3		122nd	+0.7	-2	-2	-0.6	-1
	121st	+0.9	-2	-7	-5	+3		121st	+0.5	-2	0	-3	0

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957

TABLE XXV

MILL A -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		In		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.
175545	WFLS	8/29/57	1	44.2	-0.5	13.2	13.0	-0.2	116	103	-13	339	321
175546	WFLS	8/30/57	1	42.7	+0.2	13.1	12.7	-0.4	106	195	-11	322	316
175579	WFLS	9/ 5/57	1	42.5	+0.2	12.5	11.9	-0.6	108	101	-7	344	335
Current Mill Average				43.1	0.0	12.9	12.5	-0.4	110	100	-10	335	324
												376	390
												-18	-11
												384 <sup>a</sup>	397
												359 <sup>a</sup>	378
												385 <sup>a</sup>	394
												-9	+9
												-11	-14

TABLE XXVI

MILL B -- 42-LB. LINERBOARD

175532	S.F.	8/26/57	7	41.8	+0.4	12.2	12.0	-0.2	98	99	+1	328 <sup>a</sup>	339
175609	S.F.	9/12/57	7	44.4	+0.1	13.5	13.1	-0.4	106	108	+2	399 <sup>a</sup>	373
Current Mill average.				43.1	+0.3	12.8	12.6	-0.2	102	103	+1	363	356
												372	400
												+11	-7
												357 <sup>a</sup>	385
												387 <sup>a</sup>	414
												-26	+27
												-7	+28

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXVII  
MILL C -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		In		g./sheet		Across	
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.
175531	WFIS	8/23/57	1	43.1	42.7	-0.4	12.9	12.7	-0.2	105	107	+2	321 <sup>a</sup>	347	+26
175645	WFIS	9/14/57	1	43.7	42.8	-0.9	12.6	12.6	0.0	107	106	-1	338 <sup>a</sup>	340	+2
175646	WFIS	9/15/57	1	44.2	42.7	-1.5	13.1	13.1	0.0	115	110	-5	313 <sup>a</sup>	361	+48
Current Mill Average				43.7	42.7	-1.0	12.9	12.8	-0.1	109	108	-1	324	349	+25
													376	407	+31

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957

TABLE XXVIII

MILL D -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Vch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
175574	WFLS	8/22/57	2	43.1	44.0 +0.9	13.7	12.9 -0.8	104	96 -8	373 <sup>a</sup>	398
175575	WFLS	8/28/57	2	42.4	44.0 +1.6	13.7	13.5 -0.2	111	110 -1	343 <sup>a</sup>	374
175578	WFLS	9/ 6/57	2	42.3	43.2 +0.9	13.7	13.2 -0.5	107	99 -8	335	363
175601	WFLS	9/ 9/57	2	43.3	45.0 +1.7	13.9	12.5 -1.4	112	108 -4	352 <sup>a</sup>	343
175610	WFLS	9/13/57	2	42.0	42.1 +0.1	13.1	12.0 -1.1	119	112 -7	325 <sup>a</sup>	313
Current Mill Average				42.6	43.7 +1.1	13.6	12.8 -0.8	110	105 -5	345	358
										IPC	Mill Diff.
										367	402
										+13	+35

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXIX

MILL E -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb		Caliper points		Bursting Strength, p.s.i. Page		Elrendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
175499	W.F.	8/19/57	2	43.6	42.7 -0.9	12.1	12.1 0.0	116	111 -5	277	289
175500	W.F.	8/19/57	2	44.0	43.3 -0.7	12.2	12.1 -0.1	115	109 -6	285	287
175547	W.F.	8/25/57	1	43.5	42.7 -0.8	12.9	12.6 -0.3	115	115 0	342	343
175643	W.F.	9/ 7/57	2	43.8	42.8 -1.0	12.3	12.4 +0.1	114	111 -3	311	317
175650	W.F.	9/ 7/57	2	43.9	42.9 -1.0	12.2	12.3 +0.1	114	111 -3	309	316
175644	W.F.S	9/ 8/57	2	43.3	42.4 -0.9	12.2	12.6 +0.4	115	112 -3	301a	343
175651	W.F.	9/11/57	2	43.9	43.0 -0.9	12.3	12.2 -0.1	119	113 -6	319	310
Current Mill Average				43.7	42.8 -0.9	12.3	12.3 0.0	115	112 -3	306	315
										359	379
											+20

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXX

MILL F -- 42-LB. LINERBOARD :

File No.	Finish	Date Made	Mch. No.	Basis Weight,		Caliper,		Bursting Strength,		Elmendorf Tear,	
				lb.	IPC Mill Diff.	points	IPC Mill Diff.	p.s.i. gage	IPC Mill Diff.	In	Across

No samples submitted

No samples submitted

TABLE XXXI

MILL G -- 42-LB. LINERBOARD

175511	W.B.	8/ 8/57	-	43.9	43.1	-0.8	12.0	11.5	-0.5	117	115	-2	358	329	-29	399a	375	-24
175512	W.B.	8/ 8/57	-	43.1	43.5	+0.4	12.0	11.6	-0.4	117	115	-2	380	359	-21	412a	408	-4
175513	W.B.	8/14/57	-	42.5	42.9	+0.4	11.7	11.2	-0.5	109	112	+3	377a	333	-44	409a	415	+6
175618	W.B.	8/23/57	-	42.5	43.0	+0.5	12.0	11.6	-0.4	115	116	+1	359a	344	-15	393a	417	+24
175619	W.B.	8/27/57	-	43.2	43.2	0.0	12.1	11.6	-0.5	114	114	0	341a	373	+32	387a	400	+13
175620	W.B.	8/29/57	-	44.1	43.4	-0.7	12.0	11.3	-0.7	108	113	+5	353a	379	+26	414a	436	+22
175621	W.B.	9/10/57	-	43.6	43.3	-0.3	11.9	11.4	-0.5	119	119	0	343	309	-34	383a	376	-7
175622	W.B.	9/10/57	-	44.1	43.0	-1.1	12.1	11.4	-0.7	115	111	-4	356a	363	+7	418a	417	-1
Current Mill Average				43.4	43.2	-0.2	12.0	11.4	-0.6	114	114	0	358	349	-9	402	406	+4

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note. All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXII

MILL H -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet		Across						
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.			
175501	W.F.	8/ 9/57	-	41.7	42.4	+0.7	11.9	12.0	+0.1	114	112	-2	324 <sup>a</sup>	339	+15	335 <sup>a</sup>	374	+39
175502	W.F.	8/ 9/57	-	42.0	42.3	+0.3	11.9	11.9	0.0	112	114	+2	319 <sup>a</sup>	337	-18	349 <sup>a</sup>	367	+18
175637	W.F.	8/27/57	-	42.8	42.3	-0.5	12.1	11.8	-0.3	103	101	-2	308 <sup>a</sup>	317	+ 9	327 <sup>a</sup>	359	+32
175638	W.F.	8/27/57	-	43.3	42.2	-1.1	12.2	11.9	-0.3	105	101	-4	312	319	+ 7	338 <sup>a</sup>	356	+18
Current Mill Average				42.5	42.3	-0.2	12.0	11.9	-0.1	108	107	-1	316	328	+12	337	364	+27

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXXIII

MILL I -- 42-LB. LINERBOARD

File No.	Furnish	Date Made	Mch No.	Basis weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet					
				lb.		Diff.	points		Diff.	p.s.i. gage		Diff.	g./sheet		Diff.			
				IPC	Mill		IPC	Mill		IPC	Mill		IPC	Mill				
175541	W.F.	8/28/57	-	44.6	44.4	-0.2	12.7	12.5	-0.2	115	117	+2	359a	361	+2	387a	399	+12
175542	W.F.	8/29/57	-	45.6	45.4	-0.2	13.6	13.2	-0.4	116	110	-6	401a	351	-50	419a	401	-18
175543	W.F.	9/4/57	-	43.6	43.7	+0.1	11.9	11.5	-0.4	114	111	-3	355a	326	-29	364a	324	-40
175624	W.F.	9/6/57	-	43.8	43.2	-0.6	12.6	12.1	-0.5	113	108	-5	322	281	-41	345a	332	-13
175625	W.F.	9/16/57	-	43.4	43.0	-0.4	13.0	12.6	-0.4	122	116	-6	358a	307	-51	399a	353	-46
175626	W.F.	9/16/57	-	42.1	41.8	-0.3	12.5	12.3	-0.2	118	113	-5	332a	305	-27	381a	375	-6
175627	W.F.	9/16/57	-	42.3	42.3	0.0	12.4	12.2	-0.2	116	113	-3	329a	300	-29	392a	360	-32
175647	W.F.	9/18/57	-	44.3	44.0	-0.3	12.4	12.5	+0.1	119	110	-9	341	300	-41	372a	392	+20
175648	W.F.	9/19/57	-	43.6	43.5	-0.1	12.1	11.9	-0.2	116	110	-6	325a	291	-34	341a	328	-13
175649	W.F.	9/23/57	-	43.9	43.5	-0.4	12.0	12.0	0.0	119	113	-6	353a	288	-65	371a	357	-14
Current Mill Average				43.7	43.5	-0.2	12.5	12.3	-0.2	117	112	-5	348	311	-37	377	362	-15

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit

Note All "current mill average" data are calculated from the totals of the individual readings.



COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXXIV

MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Ych. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. Gage		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
175504	N	8/ 7/57	4	43.4	-0.4	13.6	12.7 -0.9	116	110 -6	397 <sup>a</sup>	395 + 8
175505	W.	8/14/57	4	41.8	-0.3	13.0	12.2 -0.8	106	105 -1	375 <sup>a</sup>	368 +21
175606	N.	9/ 5/57	4	43.9	-0.9	13.6	12.9 -0.7	110	103 -7	367	361 -18
175607	W.	9/ 7/57	4	43.6	-0.9	13.0	12.2 -0.8	114	113 -1	364	383 -19
Current Mill Average				43.2	-0.7	13.3	12.5 -0.8	111	108 -3	376	377 + 1
										381	379 - 2

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXXV

MILL K -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight,		Caliper, points		Bursting Strength, p.s.i.		In		Elmendorf Tear, g./sheet		Across	
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.
175497	--	8/12/57	-	42.3	42.4	+0.1	14.2	13.6	-0.6	113	109	-4	308	287	-21
175498	--	8/16/57	-	43.6	42.8	-0.8	13.5	13.0	-0.5	121	113	-8	296 <sup>a</sup>	266	-30
175639	W.F.	8/20/57	1	42.0	41.6	-0.4	13.0	12.7	-0.3	114	109	-5	286	265	-21
175640	W.F.	8/23/57	1	41.9	41.5	-0.4	13.0	12.6	-0.4	118	108	-10	271 <sup>a</sup>	279	+8
175641	W.F.	8/28/57	1	41.9	41.8	-0.1	12.8	12.7	-0.1	114	108	-6	281 <sup>a</sup>	280	-1
175642	W.F.	9/4/57	1	44.0	42.4	-1.6	13.9	13.3	-0.6	114	110	-4	297 <sup>a</sup>	271	-26
Current Mill Average.				42.6	42.1	-0.5	13.4	13.0	-0.4	115	110	-5	290	275	-15
													364	354	-10

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXXVI  
MILL L -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. gage		In		g./sheet		Across	
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.
175495	A.F.	8/15/57	1	44.1	43.9	-0.2	12.9	13.1	+0.2	113	111	-2	325 <sup>a</sup>	317	+8
175496	W.F.	8/20/57	1	43.9	43.2	-0.7	12.9	13.1	+0.2	116	113	-3	306 <sup>a</sup>	316	+10
175623	A.F.	8/27/57	1	44.2	43.9	-0.3	12.7	13.1	+0.4	114	114	0	302	303	+1
175633	A.F.	9/ 5/57	1	44.2	43.4	-0.8	12.9	13.0	+0.1	116	113	-3	288 <sup>a</sup>	314	+26
175634	A.F.	9/ 9/57	1	44.1	44.3	+0.2	13.0	13.0	0.0	115	114	-1	317 <sup>a</sup>	317	0
175635	A.F.	9/11/57	1	43.8	44.1	+0.3	13.0	12.9	-0.1	115	113	-2	287 <sup>a</sup>	319	+32
175636	A.F.	9/16/57	1	44.1	44.5	+0.4	13.0	13.0	0.0	116	112	-4	294 <sup>a</sup>	315	+21
Current Mill Average				44.1	43.9	-0.2	12.9	13.0	+0.1	115	113	-2	303	314	+11
													IPC	Mill	Diff.
													357 <sup>a</sup>	371	+14
													359 <sup>a</sup>	379	+20
													349 <sup>a</sup>	359	+10
													363 <sup>a</sup>	368	+5
													359 <sup>a</sup>	363	+4
													331 <sup>a</sup>	370	+39
													355 <sup>a</sup>	365	+10

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXVII

MILL M -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		IPC Mill Diff.		IPC Mill Diff.		In		IPC Mill Diff.		Elmendorf Tear, g./sheet		IPC Mill Diff.		Across	
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	IPC	Mill	IPC	Mill	IPC	Mill
175509	A.F.	8/19/57	2	44.1	44.5	+0.4	12.8	12.3	-0.5	114	113	-1	371	398	+27	417a	479			417a	479		
175510	A.F.	8/20/57	2	44.1	44.5	+0.4	12.9	12.4	-0.5	110	114	+4	375	383	+8	405a	473			405a	473		
175604	A.F.	9/3/57	2	44.0	43.3	-0.7	13.3	13.4	+0.1	109	110	+1	359a	394	+35	385a	467			385a	467		
175605	A.F.	9/4/57	2	44.1	44.0	-0.1	13.3	13.4	+0.1	111	110	-1	345	396	+51	398a	457			398a	457		
Current Mill Average				44.1	44.1	0.0	13.1	12.8	-0.3	111	112	+1	362	393	+31	401	469			401	469		

TABLE XXVIII

MILL N -- 42-LB. LINERBOARD

175544	.FIS	9/1/57	1	43.6	42.1	-1.5	13.6	12.9	-0.7	109	109	0	311a	328	+17	357a	408			357a	408		
175581	.FIS	9/1/57	1	43.4	42.1	-1.3	13.8	12.9	-0.9	117	109	-8	363	324	-39	374a	408			374a	408		
175631	.FIS	9/10/57	1	43.5	42.6	-0.9	13.0	13.3	+0.3	110	103	-7	304	417	+113	352a	432			352a	432		
175632	.FIS	9/10/57	1	42.8	42.7	-0.1	13.6	13.2	-0.4	109	102	-7	325a	411	+86	347a	440			347a	440		
Current Mill Average				43.3	42.4	-0.9	13.5	13.1	-0.4	111	106	-5	326	370	+44	358	422			358	422		

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XXXIX

MILL O -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		In		Elmendorf Tear, g./sheet		Across	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.
175508	WFLS	8/24/57	1	42.3	41.9 -0.4	12.3	11.7 -0.6	117	108 -9	355	369 +14	408 <sup>a</sup>	466	486	+58
175503	WFLS	8/26/57	1	41.2	41.9 +0.7	12.1	11.7 -0.4	103	99 -4	341	341 0	377 <sup>a</sup>	424	424	+47
Current Mill Average				41.7	41.9 +0.2	12.2	11.7 -0.5	110	104 -6	348	355 +7	393	445	445	+52

TABLE XL

MILL P -- 42-LB. LINERBOARD

175506	W.F.	8/21/57	2	41.9	42.0 +0.1	12.0	11.7 -0.3	111	110 -1	312	313 +1	368 <sup>a</sup>	366	366	-2
175507	W.F.	8/21/57	2	41.9	42.0 +0.1	12.1	11.8 -0.3	115	112 -3	309	309 0	357 <sup>a</sup>	359	359	+2
175548	W.F.	8/27/57	1	44.3	44.1 -0.2	12.8	12.3 -0.5	116	113 -3	333	347 +14	386 <sup>a</sup>	375	375	-11
175549	W.F.	8/27/57	1	44.1	44.4 +0.3	12.6	12.4 -0.2	115	111 -4	335	349 +14	369 <sup>a</sup>	368	368	-1
175576	W.F.	8/30/57	2	43.1	43.7 +0.6	12.4	12.0 -0.4	114	108 -6	321	315 -6	359 <sup>a</sup>	359	359	0
175577	W.F.	8/30/57	2	43.1	43.6 +0.5	12.1	12.0 -0.1	113	109 -4	314	319 +5	361 <sup>a</sup>	359	359	-2
175582	W.F.	8/31/57	1	42.2	42.5 +0.3	12.0	11.6 -0.4	115	111 -4	303	317 +14	361 <sup>a</sup>	341	341	-20
175583	W.F.	8/31/57	1	42.2	42.8 +0.6	12.0	11.8 -0.2	115	114 -1	316	311 -5	344	343	343	-1
Current Mill Average				42.8	43.1 +0.3	12.2	11.9 -0.3	114	111 -3	318	322 +4	363	359	359	-4

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--SEPTEMBER 1 THROUGH SEPTEMBER 30, 1957 (continued)

TABLE XLI  
MILL Q -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. edge		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
		</									

No samples submitted

TABLE XLII  
MILL S -- 42-LB. LINERBOARD

175611	W.F.	8/28/57	-	44.3	44.4	+0.1	13.2	12.9	-0.3	108	105	-3	359 <sup>a</sup>	361	+2	369 <sup>a</sup>	369	0
175612	W.F.	8/29/57	-	43.7	44.2	+0.5	12.8	12.5	-0.3	104	104	0	355 <sup>a</sup>	371	+16	388 <sup>a</sup>	375	-13
175613	W.F.	8/30/57	-	45.2	44.5	-0.7	12.8	12.8	0.0	109	106	-3	373 <sup>a</sup>	361	-12	390 <sup>a</sup>	395	+5
175615	W.F.	9/11/57	-	43.8	43.0	-0.8	12.9	12.9	0.0	110	101	-9	346 <sup>a</sup>	328	-18	378 <sup>a</sup>	363	-15
175616	W.F.	9/12/57	-	43.7	43.1	-0.6	12.5	12.6	+0.1	107	106	-1	330 <sup>a</sup>	314	-16	365 <sup>a</sup>	369	+4
175617	W.F.	9/13/57	-	44.0	43.4	-0.6	12.4	12.4	0.0	108	108	0	333 <sup>a</sup>	329	-4	367 <sup>a</sup>	385	+18
175628	W.F.	9/18/57	-	44.0	43.8	-0.2	12.0	12.0	0.0	106	104	-2	337	325	-12	369 <sup>a</sup>	387	+18
175629	W.F.	9/19/57	-	44.2	44.2	0.0	12.4	12.3	-0.1	112	107	-5	334 <sup>a</sup>	323	-11	372 <sup>a</sup>	360	-12
175630	W.F.	9/20/57	-	44.0	43.9	-0.1	13.5	13.0	-0.5	112	105	-7	364 <sup>a</sup>	343	-21	404 <sup>a</sup>	384	-20
Current Mill Average.				44.1	43.8	-0.3	12.7	12.6	-0.1	108	105	-3	348	339	-9	378	376	-2

TABLE XLIII  
MILL R -- 47-LB. DRUM LINERBOARD

No samples submitted

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.  
Note All "current mill average" data are calculated from the totals of the individual readings.